

Amendments to the Claims

Please make amendments to the claims where noted. The amendments are all supported by the originally-filed application and no new matter has been added. Deleted text has been struck through; new text is underlined.

1. (currently amended) A high-to-low voltage interface integrated circuit (interface IC) configured to be coupled to an external sensing resistor, a low voltage source and a high voltage source, and a signal source for producing a signal consisting essentially of a high voltage on which a small voltage signal is superimposed comprising:

a) current source means, configured to be coupled to the high voltage source and the low voltage source, signal source for creating a reference current ~~and mirror currents~~ based on the high voltage ~~source~~ and a differential current which is based in part on the small voltage signal; and

b) means for current-to-voltage conversion, configured to be coupled to the current source means, for rejecting processing the reference and differential currents by eliminating the high voltage signal and converting the a portion of the differential current caused by the low small voltage signal that flows through the sensing resistor into a voltage proportional to the low small voltage source signal.

2. (currently amended) The interface IC of claim 1 wherein the current source means further comprises a first NMOS transistor, a second NMOS transistor, and a third NMOS transistor; the first NMOS transistor ~~have~~ having a drain and a gate coupled to each other and to a first resistor, and having a source coupled to an electrical ground; the second and third NMOS transistors both having gates coupled to each other and to the gate of the first NMOS transistor, the second and the third NMOS transistors also both having sources coupled to the electrical ground; a drain of the second NMOS transistor being coupled to a second resistor and a drain of

the third NMOS transistor being coupled to a third NMOS ~~transistor~~ resistor.

3. (currently amended) The interface IC of claim 1 wherein the means for current-to-voltage conversion further comprises an operational amplifier (op-am) with a non-inverting input terminal, an inverting input terminal and an output terminal; the non-inverting input terminal and the inverting input terminal being coupled to the current source means; the output terminal of the op-amp being coupled to the inverting input terminal through a ~~fourth~~ first resistor; the non-inverting terminal being coupled to an external reference voltage source through a ~~fifth~~ second resistor; a first DC ~~couple~~ terminal of the op-amp being coupled to an external voltage source for setting the upper voltage limit for the op-amp, and a second DC ~~couple~~ terminal being coupled to the electrical ground for setting a lower voltage limit for the op-amp.

4. (currently amended) The interface IC of claim 1 further ~~comprises~~ comprising means for electrostatic discharge (ESD) protection.

5. (currently amended) The interface IC of claim 4 wherein the means for ESD protection comprises a first and second pn junction devices coupled in series to another and to the current source means; an an anode terminal of the first pn junction device being coupled to the electrical ground and a cathode terminal of the first pn junction device being coupled to the anode terminal of the second pn junction device and to the current source means; the cathode terminal of the second pn junction device being coupled to a voltage source for ~~prevent~~ preventing ESD discharge therefrom into the current source means.

6. (currently amended) ~~An~~ A high-to-low voltage interface integrated circuit (interface IC) configured to be coupled to

an external sensing resistor, ~~a low voltage source and a high voltage source,~~ and a signal source for producing a signal consisting essentially of a high voltage on which a small voltage signal is superimposed comprising:

a) current source means, configured to be coupled to the high voltage source and the low voltage source, signal source for creating a reference current ~~and mirror currents~~ based on the high voltage ~~source~~ and a differential current based in part on the small voltage signal;

b) means for current-to-voltage conversion, configured to be coupled to the current mirror source means, for ~~rejecting~~ processing the reference and differential currents by eliminating the high voltage signal and converting ~~the~~ a portion of the differential current caused by the ~~low~~ small voltage signal flowing through the sensing resistor into a voltage proportional to the low voltage ~~source~~ signal; and

c) external RC low pass filters coupled to the sensing resistor and the low voltage signal and a high voltage signal ~~so as~~ signal source configured to filter out high frequency signals therefrom.

7. (currently amended) The interface IC of claim 6 wherein the current source means further comprises a first NMOS transistor, a second NMOS transistor, and a third NMOS transistor; the first NMOS transistor ~~have~~ having a drain and a gate coupled to each other and to a first resistor, and having a source coupled to an electrical ground; the second and third NMOS transistors both having gates coupled to each other and to the gate of the first NMOS transistor, the second and the third NMOS transistors also both having sources coupled to the electrical ground; a drain of the second NMOS transistor being coupled to a second resistor and a drain of the third NMOS transistor being coupled to a third ~~NMOS transistor~~ resistor.

8. (currently amended) The interface IC of claim 6 wherein the means for current-to-voltage conversion further comprises an operational amplifier (op-am) with a non-inverting input

terminal, an inverting input terminal and an output terminal; the non-inverting input terminal and the inverting input terminal being coupled to the current source means; the output terminal of the op-amp being coupled to the inverting input terminal through a ~~fourth~~ first resistor; the non-inverting terminal being coupled to an external reference voltage source through a ~~fifth~~ second resistor; a first DC ~~couple~~ terminal of the op-amp being coupled to an external voltage source for setting the upper voltage limit for the op-amp, and a second DC ~~couple~~ terminal being coupled to the electrical ground for setting a lower voltage limit for the op-amp.

9. (currently amended) The interface IC of claim 6 further ~~comprises~~ comprising means for electrostatic discharge (ESD) protection.

10. (currently amended) The interface IC of claim 4 wherein the means for ESD protection comprises a first and second pn junction devices coupled in series to another and to the current source means; an anode terminal of the first pn junction device being coupled to the electrical ground and a cathode terminal of the first pn junction device being coupled to the anode terminal of the second pn junction device and to the current source means; the cathode terminal of the second pn junction device being coupled to a voltage source for ~~prevent~~ preventing ESD discharge therefrom into the current source means.